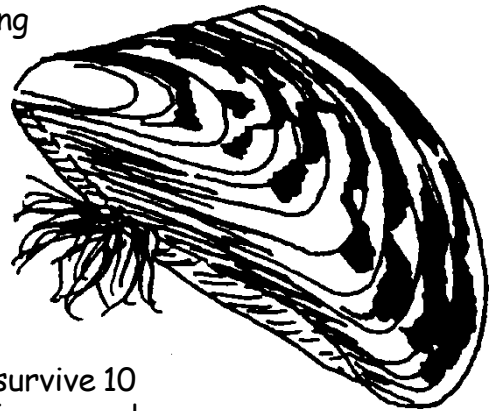


UNFAIR ADVANTAGE!

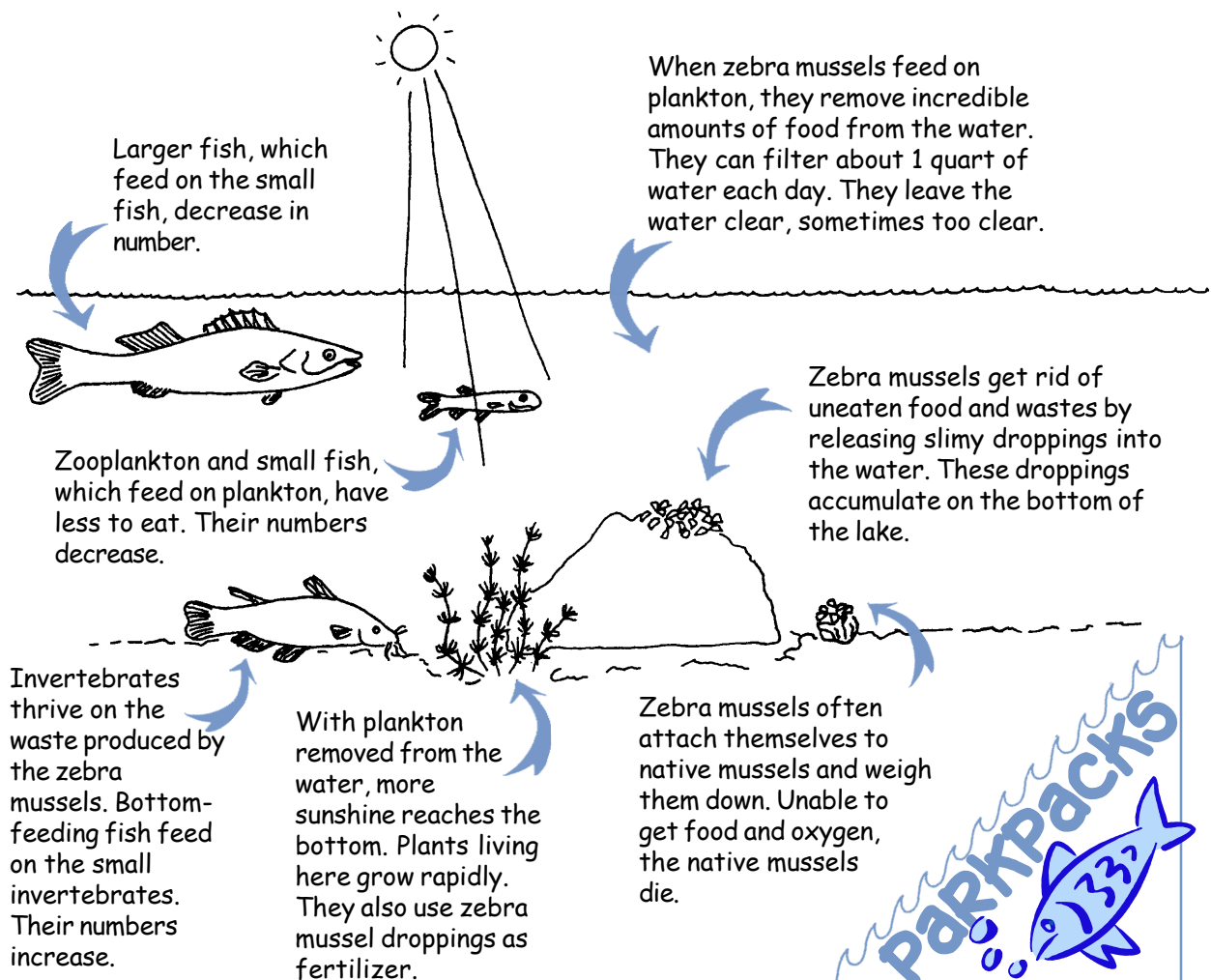
Does it bother you when someone excels in everything they do? They just roll over the competition. No one else even has a chance!

That's what zebra mussels do! They're little, but they're tough. Consider this . . . female zebras can produce 30,000 to 1,000,000 eggs in one year! The young, called veligers, can survive for a month in water with little or no food. Even though very few of the veligers survive to adulthood, so many do that populations can explode! And the adults can survive 10 days out of water. They can even live without food for a year!



AND THAT'S NOT ALL!

Take a look at how zebra mussels mess up the ecology of the lake.



CHECK IT OUT!

There's no question that zebra mussels are doing very well in Wisconsin's waters. They're not only surviving - they're thriving! You can find out more about the zebra mussel population by taking samples of the empty shells. Take a **rope** or string about 10 feet long and tie it into a circle. Print out a copy of the **Operation Population chart**, grab a **pencil**, and head down to a lake.

To choose a sample area, just toss the rope onto the rocks or sand. Arrange it into a circle. Now, collect all the zebra mussel shells from inside the circle.

Sort through the shells. Are they all the same size? Have they all been lying on the beach the same amount of time? After a big storm, you can usually find fresher shells that were just washed up on the beach. As time passes, the waves, wind, and people break the shells down. What other clues can you use to predict how long the zebra mussels have been dead? (See #1 below for answer.)

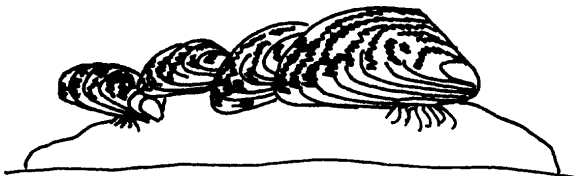
Follow the directions on the **Operation Population** chart to find out more about the zebra mussel population in this part of Wisconsin.

LIFE AS A ZEBRA

Zebra mussels start life as free-swimming young called veligers. When they are about 1 month old, they settle down and attach to a solid surface. During their first year of life, they grow from microscopic size to about 14 mm in length. At this time, they are adults and can begin to reproduce. For the next several years, they only grow about 4mm every year. Why do you think their growth rate goes way down when they become adults? (See #2 below for answer.)


**FREE-
SWIMMING
VELIGERS**


**YOUNG ZEBRA
MUSSEL**


**ADULT ZEBRA
MUSSELS**

- Answers to Questions!
1. Shells from zebra mussels that died recently might have more distinct stripes, connect at the hinge, contain bits of tissue, and stink. Older zebra mussels' shells would be bleached out, broken, and partly dissolved.
 2. During the first year of life, a zebra mussel uses its energy to grow to adult size. After becoming an adult, it uses most of its energy to reproduce, and its growth rate slows way down.

ParkPacks

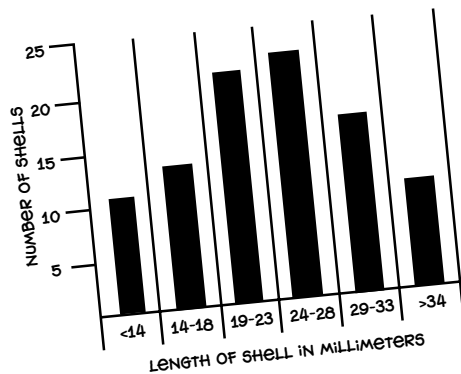
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WISCONSIN DEPARTMENT OF NATURAL RESOURCES
UNIVERSITY OF WISCONSIN Sea Grant

To choose a sample area, just toss the rope onto the rocks or sand. Arrange the rope into a circle.

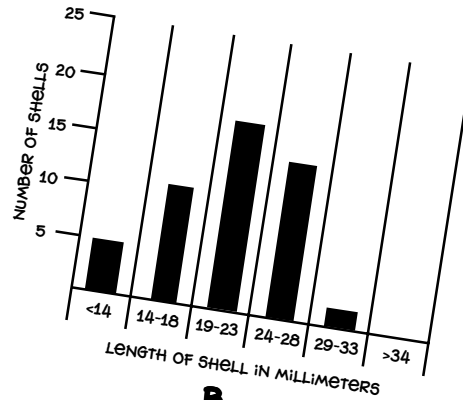
* Actual growth rates depend on the quality of the habitat, competition, and other physical conditions. This is just an estimate!

Make a bar graph showing the number of shells you found for each size.

NUMBER OF SHELLS IN EACH SIZE GROUPING	LESS THAN 14 MM	14 - 18 MM	19 - 23 MM	24 - 28 MM	29 - 33 MM	OVER 34 MM
	LENGTH OF SHELL IN MILLIMETERS					



A

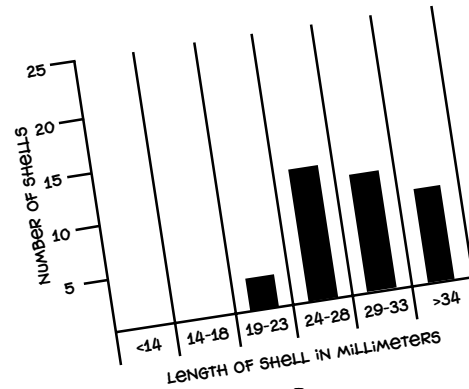


B

DOES YOUR GRAPH LOOK LIKE ANY OF THESE?

Zebra mussel shells were counted at 3 different locations. What predictions could you make about the populations of zebra mussels based on these bar graphs?

What predictions could you make about the zebra mussel population in this part of the lake based on your bar graph? How could you test your prediction?



C

- Some possible interpretations of the bar graphs:
- (A) You might predict that the population of zebra mussels is healthy and well established. There are young and old mussels spanning several years.
 - (B) You might hypothesize that:
 - This is a relatively new invasion of zebra mussels, and they haven't lived here long enough for older, larger mussels to be present, or
 - Something is preventing the zebra mussels from growing older, and they are dying young, or
 - The zebra mussels are not doing well. They might be old, but something is slowing down their growth.
 - (C) You might hypothesize that:
 - Something has changed and is preventing young zebras from settling on solid surfaces and growing, or
 - There has been a change in the environment and only the larger mussels were able to survive.

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